37. (currently amended) A device for detecting ionizing radiation, comprising: a plurality of layers joined together to form a multilayer stack, wherein each layer comprises an array of wires embedded in ~~the material of claim 1~~ a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first ~~set~~ plurality of parallel wires intersecting orthogonally with a second ~~set~~ plurality of parallel wires; and means for supplying power to each array.

38. (currently amended) The device of claim 37, wherein the wires in each array are spaced at a distance of from 10μm to 100μm apart.

39. (canceled)

40. (currently amended) A device for detecting ionizing radiation, comprising:

a pair of electrodes, each having a length and width, wherein the length is greater than the width;

a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm disposed between said electrodes, wherein the combination of electrodes and π-conjugated ~~polymer~~ material is rolled up along their length to form a generally cylindrical-shape structure; and

means for providing power to said electrodes.

41-46. (canceled)

47. (currently amended) ~~The material~~ The device as in any one of claims ~~1~~, ~~3~~, ~~12~~, ~~24~~, 35, 37 and 40 wherein an external stress is applied to the π-conjugated material by stretching ~~the π-conjugated material to strain and orient the polymer chains~~.

48. (currently amended) The device of claim 47, wherein the external stress is applied at a temperature above the glass transition temperature of the material and below the melting temperature.

49. (canceled).

50. (currently amended) A device for detecting ionizing radiation, comprising:

electrodes, wherein said electrodes are ~~composed of~~ silicon wafers having prefabricated pulse detection circuitry patterned thereon;

~~the material of claim 1~~ a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm disposed between said electrodes; and

power supply means for providing power to said electrodes.

51. (currently amended) A method for detecting ionizing radiation, comprising:

providing an array of wires embedded in ~~the material of claim 1~~ a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first ~~set~~ plurality of parallel spaced apart wires intersecting orthogonally with a second ~~set~~ plurality of parallel spaced apart wires, wherein each wire in the first plurality intersects with each wire in the second plurality;

supplying electric power to the array;

inserting the array into a radiation field; and

detecting the signal generated when radiation strikes the wires.

52. (previously presented) The method of claim 51, wherein the array is a multilayer array.

53. (new) The device as in any one of claims 35 or 37, wherein the wires are electrically conducting oxides, electrically conducting polymers or combinations thereof.

54. (new) The device of as in any one of claims 35, 37, 40, and 50 wherein the π-conjugated material comprises a mixture of π-conjugated materials.

55. (new) The device of claim 54, wherein the π-conjugated material includes π-conjugated polymers having long chains of alternating single and double carbon-carbon bonds, polyaromatic hydrocarbons, or quinolates.

56. (new) The device of claim 55, wherein the π-conjugated polymers are selected from the group of polymers consisting of polyacetylenes, polypyrroles, polyfluorines, and derivatives and combinations thereof.

57. (new) The device of claim 56, wherein the derivative π-conjugated polymer is selected from the list of polymers consisting of poly(1-methoxy-4-(2-ethylhexyloxy)-2,5-phenylenevinylene), poly(2,5-dioctyloxy-p-phenylenevinylene), poly(3,4-ethylene dioxythiophene), and poly(3-octylthiophene), and combinations thereof.

58. (new) The device of claim 55, wherein the polyaromatic hydrocarbons include naphthalene, anthracene, or rubrene.

59. (new) The device of claim 55, wherein the π-conjugated polymers are mixed with organic polymers.

60. (new) The device of claim 59, wherein the organic polymers include polystyrene or poly(methyl methacrylate).

61. (new) The device as in any one of claims 35, 37, 40 and 50 wherein a metal is incorporated into the structure of the π-conjugated material.

62. (new) The device of claim 61, wherein the metal is aluminum, gallium, boron or lithium and salts thereof.

63. (new) A method for tracking 1-10 MeV particles, comprising;

providing a plurality of layers, wherein each layer consists of an array of wires embedded in a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first plurality of parallel spaced apart wires intersecting orthogonally with a second plurality of parallel spaced apart wires, wherein the parallel wires in each array are spaced at a distance of between 10-100 μm apart and wherein each wire in the first plurality intersects with each wire in the second plurality;

supplying electric power to the array;

inserting the array into a radiation field; and

detecting the signal generated when radiation strikes the wires.

64. (new) A method for tracking 1-10 MeV neutrons, comprising:

providing a plurality of layers, wherein each layer consists of an array of wires embedded in a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical resistivity of at least 10^9 ohm-cm, the array comprising a first plurality of parallel spaced apart wires intersecting orthogonally with a second plurality of parallel spaced apart wires, wherein the parallel wires in each array are spaced at a distance of between 10-100 μm apart and wherein each wire in the first plurality intersects with each wire in the second plurality;

supplying electric power to the array;

inserting the array into a radiation field; and

detecting the signal generated when radiation strikes the wires.

65. (new) A method for detecting d,t reactions, comprising:

providing a plurality of layers, wherein each layer consists of an array of wires embedded in a solid organic semiconducting material consisting essentially of a π-conjugated material having an electrical

resistivity of at least 10^9 ohm-cm, the array comprising a first plurality of parallel spaced apart wires intersecting orthogonally with a second plurality of parallel spaced apart wires, wherein the parallel wires in each array are spaced at a distance of between 10-100 μm apart and wherein each wire in the first plurality intersects with each wire in the second plurality;

supplying electric power to the array;

inserting the array into a radiation field; and

detecting the signal generated when radiation strikes the wires.